Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
Progeny LMS, LLC	)	RM-10403
Amendment of Part 90 of the Commission's Rules Governing the Location and Monitoring Service to Provide Greater Flexibility	)	

Reply Comments of Progeny LMS, LLC

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Summary

The Part 15 operators and manufacturers who have filed comments addressing Progeny's petition for regulatory flexibility in the 902-928 megahertz band have either failed to state a case—or have provided further grounds to support—Progeny's request for a rulemaking proceeding to re-examine the Commission's Part 90 rules that apply to multilateration Location and Monitoring Service ("LMS"). Part 15 commenters have been unable to explain why the Commission should not act now to adjust its rules to take into account regulatory, technological and market changes that have occurred since the Commission originally set those rules. Instead, the Part 15 manufacturers and operators wish to simply preserve the status quo in which unlicensed devices have gained a spectrum reserve, free from all multilateration operations in the 900 MHz band. The Commission never intended such a result when it licensed LMS services, and the current imbalance in the rules does not serve the public interest.

Progeny is not advocating rule changes that would reallocate the 902-928 MHz band or push Part 15 providers out of it. Progeny is seeking only calibrated rule changes that would allow the Commission to achieve the finely tuned balance between licensed and unlicensed uses of the band that the Commission initially sought. That balance has not been achieved, as evidenced by the lack of any viable multilateration LMS operation in the band. Progeny simply seeks to establish this balance by eliminating the outmoded, blunt regulatory instruments represented by the existing service and spectrum restrictions and replacing them with an approach more in keeping with current regulatory principles and market realities. That approach would couple flexible spectrum use policies with

narrowly targeted interference-mitigation techniques where needed. Potential or actual harmful interference could be avoided or managed primarily through a natural progression of adopting frequency-agile transmission technologies, or, where needed, through a negotiated rulemaking or an industry discussion and coordination process.

Progeny fully believes that the deployment of spectrally efficient technologies, coupled with the technical characteristics of LMS and Part 15 systems, will obviate the need for interference mitigation. But where such a need arises, it can be addressed directly through negotiated, targeted solutions, incorporating techniques such as directional antennas for base station transmission, power control algorithms, and discontinuous transmissions. These techniques, implemented as needed through an independent, industry-led negotiation process, would provide greater incentives for LMS and Part 15 companies to adopt the most frequency-agile, spectrally efficient technologies, promoting innovation and optimal use of the band. Moreover, they would replace blanket restrictions on LMS that have stifled the development of the service and posed an intolerable risk for potential investors and equipment manufacturers.

This petition comes at a time when manufacturers are taking advantage of the Part 15 rules to develop and deploy equipment for a burgeoning market in wireless local area networking devices. The FCC has responded by broadening the ability of Part 15 manufacturers to employ the most current, cutting edge transmission technologies. Many of these devices, however, are being developed for the 2.4 gigahertz and 5.7 GHz bands, raising the question of why Part 15 manufacturers should continue to demand restrictive rules that limit licensed uses at 900 MHz. Progeny does not want to foreclose the development of Part 15 technologies in that band; it simply asks the Commission to open a proceeding to examine whether the current LMS service and spectrum aggregation restrictions are necessary given these technological and market changes.

It is not enough for Part 15 providers to say no to any change in the rules that would alter a status quo that benefits only themselves, while precluding the development of multilateration LMS. The potential of LMS is too great as a service that could directly benefit the lives and safety of large numbers of individuals and which could indirectly help buoy the wireless telecommunications sector and the economy as a whole. The 902 to 928 MHz block is well situated spectrum, that is not being optimized. Progeny believes that a rulemaking proceeding is the best, and only, way to reach a regulatory balance that will allow all users of the band to develop and deploy the services and equipment that the market demands. Therefore, Progeny urges the Commission to move expeditiously to open a proceeding to modify its Part 90 rules governing multilateration LMS.

Progeny LMS, LLC ("Progeny"), hereby files its reply comments in the above-captioned proceeding, pursuant to the Commission's public notices dated April 10, 2002 and May 7, 2002.[1] In those public notices, the Commission sought comments on Progeny's March 5, 2002, rulemaking petition, in which Progeny asked it to eliminate or substantially modify its Part 90 rules that limit the abilities of multilateration LMS licensees to provide a viable service in the 902-928 megahertz band (See Appendix A). Seven parties--mostly providers or operators of unlicensed, Part 15 devices--filed comments on May 15, 2002.[2]

The Part 15 commenters have either failed to state a case as to why the Commission should not initiate a rulemaking to grant additional flexibility to providers of multilateration location and monitoring service ("LMS") or have provided information that builds a foundation for such a proceeding.[3] Progeny therefore urges the Commission to proceed without delay to open a rulemaking proceeding to re-examine its Part 90 rules affecting LMS providers. Specifically, Progeny urges the Commission to eliminate or modify (1) the spectrum cap that prevents aggregation of multilateration LMS licenses in the band; (2) the service restrictions on LMS offerings; (3) the ban on real-time

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[1] See "Wireless Telecommunications Bureau Seeks Comment on Petition for Rulemaking Regarding Location and Monitoring Service Rules, Public Notice, DA 02-817 (rel. April 10, 2002); and "Wireless Telecommunications Bureau Extends Comment Cycle on Petition for Rulemaking Regarding Location and Monitoring Service Rules," Public Notice, DA 02-1070 (rel. May 7, 2002).

[2] Warren C. Havens and Telesaurus Holdings GB, LLC filed comments partially supporting Progeny's call for changes in the Part 90 rules governing LMS services and also describing a proposal for an alternative service to be offered in the band.

[3] References to LMS licenses herein refer to multilateration LMS licenses unless otherwise specified. Non-multilateration LMS systems are licensed in the 902-904 MHz and 909.75-921.75 MHz bands, and only on a site-by-site basis, with a limited exception for government licenses.

interconnection with the public switched telephone network ("PSTN"); and (4) the "safe harbor" and field demonstration provisions that place the onus of non-interference on LMS licensees, which are primary to users and manufacturers that operate in the band under Part 15 of the Commission's rules.

In its petition, Progeny noted several key regulatory, technological, and market changes that have taken place since the Commission set its rules governing the band in 1995. Among these changes is the movement by manufacturers of unlicensed wireless local area networking ("WLAN") equipment to develop and deploy equipment for the 2.4 gigahertz and 5.7 GHz bands, rather than the 902-928 MHz band. On the regulatory side, the Commission has shown its leadership among regulators around the world in adopting more flexible rules for use of spectrum by licensees, accompanied by narrowly tailored protections against harmful interference, where needed. These changes indicate that it is now time for the Commission to re-examine whether it has given multilateration LMS licensees enough flexibility to respond to the marketplace shifts that have occurred and will continue to occur with increasing rapidity. Nothing in the first round of comments has altered Progeny's belief that rule changes are needed at this juncture—indeed, the comments in many ways validate Progeny's position. A rulemaking is the best, and indeed the only way, at this point, to ensure the optimal use of this prime block of spectrum.

In comments on Progeny's position, however, the Part 15 commenters simply refused to address the changes that have occurred in the marketplace since the Commission set its rules in the 1990s. Moreover, they failed to explain why the Commission's policy of granting flexibility to license-holders should not be applied to this band, in tandem with practical and supple interference mitigation techniques, rather than outmoded service and spectrum restrictions.

Instead, the Part 15 commenters have chosen to simply say, "No." They have urged the Commission to respond to the clear changes in market and regulatory circumstances by simply ignoring them. The Commission's stated policy and role, however, is to maximize the use of technology and spectrum in order to allow provision of optimal, innovative services in the public interest. It is not, as the Part 15 commenters appear to assume, to preserve a status quo that serves only themselves and denies the legitimately licensed spectrum holders the ability to adequately serve the public. The Part 15 operators ignore the fact that in setting the rules for LMS, the Commission sought to craft a balance between the potential for roll-out of an innovative new service and the realities of continuing unlicensed use of the band. That balance is nowhere in evidence in the marketplace, despite the Commission's valiant efforts. This is further supported by the comments filed by another LMS licensee, Warren C. Havens and Telesaurus Holdings GB, LLC ("Havens/Telesaurus"), which supported Progeny's call for eliminating certain restrictions and further suggested a new approach to developing what is now a highly constrained licensed service in the band. In urging the Commission to reject Progeny's petition, the Part 15 commenters are simply trying to maintain a regulatory imbalance that has left the 902-928 MHz band as an unintended preserve for their sole commercial use.

Progeny believes, however, that the Commission was correct in concluding that LMS and Part 15 usage can coexist in this band. Based on experience with its existing rules, the Commission can now open a proceeding to adjust those rules, taking into account the most current techniques for spectrum sharing and interference mitigation. These technologies obviate the need for the blunt tools of service and spectrum restrictions, which were largely intended to prevent interference by dampening LMS traffic volume—a technique that has worked, unfortunately, too well, to the extent of eliminating any LMS traffic at all.

Based on the rapidly innovating technical characteristics of LMS systems and Part 15 devices, Progeny believes that these technologies can coexist in the band in most, if not all, circumstances. This is especially true since many of the mass-market WLAN devices are being designed and produced for 2.4 GHz and higher. Moreover, even where the risk of harmful interference arises—which Progeny believes will be less frequent than the Part 15 operators assert—the Commission can employ a strategy that relies on models of flexible use that have been developed not only by the Commission itself, but by regulators in other nations such as Australia—without jeopardizing co-channel sharing. If necessary, however, Progeny suggests a negotiated rulemaking approach that could identify potential interference problems between LMS operations and Part 15 uses and develop sufficient targeted mitigation techniques to forestall or address harmful interference. Application of this approach would promote more efficient use of spectrum in the band and allow more robust use of licenses already granted to LMS providers—as well as those licenses yet to be auctioned. In addition, this approach would promote and allow the phased-in adoption of more spectrum-agile Part 15 technologies, rather than simply enshrining and preserving the use of outdated technologies.

Through a rulemaking, the Commission can take advantage of current interference-mitigation techniques and establish an environment that promotes the most spectrum-efficient technologies. Without such a rulemaking, this band will not be able to sustain any commercial, licensed use, hobbling the Commission's efforts to auction further licenses and ending any chance for existing licensees to realize the value of their investments.

I. Part 15 Commenters Have Erred In Their Assessment of the Band and Mischaracterized Progeny's Petition.

A. Progeny Is Not Seeking a Reversal in the Commission's Policies, Simply a Fair Opportunity To Deploy Its Network.

As a threshold matter, the parties who have filed in opposition to Progeny's petition have mischaracterized that petition in fundamental ways. Progeny is not seeking a major alteration of Commission policy, nor is it seeking to abruptly end the use of the 902-928 MHz band for unlicensed operations pursuant to Part 15. Rather, Progeny is seeking to explore ways in which the Commission's Part 90 rules can be adjusted to allow harmonious operation of both LMS and Part 15 providers. There is nothing to be lost in examining those rules, in light of current technical, regulatory and market realities, and much to be gained in terms of advancing the ability of all stakeholders in the band to apply the most current sharing technologies. Given the current situation of increasing commercial and public-sector demands for spectrum, it is vital that the Commission act to encourage such technologies.

In addition, Progeny and other LMS licensees are not asking the Commission, as some commenters suggest, to rig a regulatory system that "guarantees" or subsidizes their operations. To the contrary, Progeny is seeking only what was intended by the

Commission when it set the rules and auctioned LMS licenses in the first place: a regulatory structure that provides a fair, open environment sufficient to attract private investment. Without such an environment, no private enterprise can succeed, and Progeny cannot accept the idea that the Commission would inaugurate the LMS service, set rules for it, and auction licenses without believing it was creating such an environment. While the Commission always attempts to set up a level playing field, in the public interest, the task was complicated in this band by the presence of existing, albeit unlicensed uses. That necessitated calibrating a careful balance between LMS operations and other uses in this somewhat constrained band. Clear evidence from the marketplace indicates that further calibration is needed: there is not a single viable multilateration LMS system in operation, and no manufacturer has seen a sufficient opportunity to build equipment for this service. The Commission was correct in inaugurating the LMS service; in order to bring that vision to fruition, however, rule changes must be contemplated.

Moreover, there is ample evidence, as discussed below, that with regard to the valuable WLAN technologies, for which a large commercial market is developing, Part 15 uses are being brought to market rapidly in the 2.4 GHz band and other bands even higher on the spectrum chart, not in the 900 MHz band. This trend offers a reality check on the issues of LMS/Part 15 coexistence raised by the Part 15 community.

B. Removing the Spectrum Cap Will Not Alter the Fact That Multilateration LMS Licenses Cover Less Than 54 Percent of the 902-928 MHz Band.

In their zeal to oppose any possible adjustment of the LMS rules, several commenters have mistakenly argued that eliminating the current effective cap on aggregation of licenses will allow multilateration licensees to operate throughout the 902-928 MHz band. For example, the License-Exempt Alliance claims that the "current LMS spectrum cap permits Part 15 operators to avoid interference to an LMS operator by deploying systems on channels not occupied by that operator. Permitting a single LMS operator to occupy the entire 902-928 MHz band would eliminate this option."[4] In addition, WaveRider argues that:

> Allowing a single licensee to hold all three LMS licenses in an EA [economic area] would also cause interference concerns for non-LMS users of the 902-928 MHz band. Through frequency planning, WaveRider can deploy its systems to operate in channels not occupied by an LMS service in order to avoid interfering with that operator. Other Part 15 devices also have this option of setting their equipment to operate in different channels in the band. Permitting the LMS operator to occupy the entire band, eliminates this option and in effect shuts out Part 15 devices.[5]

Ricochet Networks similarly notes that its network is based on frequency-hopping, arguing that "to the extent that one [LMS] operator can dominate the entire band, there is less of an opportunity to avoid such interference."[6]

These comments reveal a misunderstanding of the nature of LMS licensing in the band and of what Progeny has proposed regarding the spectrum cap. Multilateration LMS systems are licensed in only three blocks of spectrum within the 902-928 MHz band:

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[4] License-Exempt Comments at page 4.

[5] WaveRider comments at page 7.

[6] Ricochet Networks comments at page 16.

- A Block: 904-909.75 MHz and 927.75-928 MHz (total 6 MHz)
- B Block: 919.75-921.75 MHz and 927.5-927.75 MHz (total 2.25 MHz)
- C Block: 921.75-927.25 MHz and 927.25-927.5 MHz (total 5.75 MHz)[7]

Hence, multilateration LMS licenses cover only 14 MHz of the entire band of 26 MHz. That amounts to just 54 percent of the entire 902-928 MHz band—not enough for any multilateration LMS provider to "dominate" it. At present, multilateration licensees are primary to non-multilateration licensees in the A and C blocks and must operate on a co-primary basis with them in the B block. In addition, a multilateration licensee may aggregate only B and C block licenses.[8]

Allowing a single licensee to aggregate all of the multilateration LMS licenses in a single EA would still leave 12 MHz--or 46 percent of the band--entirely free from multilateration LMS operations of any sort. In fact, that is exactly the same profile that currently exists in the band. Eliminating the spectrum cap for multilateration LMS would do nothing to alter the amount of spectrum Part 15 users can employ, free of any possibility of multilateration LMS interference, under the Commission's rules. Elimination of the spectrum cap would only allow a single licensee to control all of the existing multilateration LMS sub-bands--not expand those sub-bands to cover the entire 902-928 MHz band.

[7] See 47 U.S.C. §90.357. Allocations listed also include the forward links set by the Commission in this rule section.

[8] See 47 U.S.C. §§90.353(d) and (f).

With the spectrum cap removed, there is technically a remote possibility that a single LMS operator could aggregate all of the multilateration *and* non-multilateration licenses in a single market. In order to gain access to the non-multilateration spectrum, however, the LMS provider would have to apply for a license on a site-by-site basis, which could be opposed if parties felt (and could prove) that it was not in the public interest. Moreover, because of the highly localized nature of non-multilateration systems—-many of which are used for automated toll and other intelligent transportation systems—such aggregation is unlikely to pose any serious interference threat. Progeny is not proposing changes to the channelization of the band between multilateration and non-multilateration systems. In fact, the ability of Part 15 operators using frequency-hopping devices to select spectrum free of multilateration LMS operations would not be affected at all by this proposed rule change.

In fact, the opposition of the Part 15 commenters to this proposal may indicate their true intent: they wish to preserve the current balkanized situation, in which there are no multilateration LMS operations at all, anywhere in the band. But the Commission's existing rules do not give them a spectrum preserve free of all LMS operations, and the proposal to eliminate the spectrum cap would not alter a single iota the fact that at least 46 percent of the band is, and would remain, completely free of multilateration LMS. Thus, it is difficult to understand how Part 15 operators, who have noted their frequency-hopping abilities in many cases, would be harmed. The failure of the Part 15 commenters to recognize the realities of licensing in the band indicates that their opposition is simply an attempt to forestall any viable LMS operation anywhere in the band. They are, in effect, arguing for the preservation of a "right" that has never been given to them.

The irony is that allowing a single operator to aggregate all of the LMS licenses in a single EA would actually improve the chances for successful mitigation of interference to other users in the band. For frequency-hopping LMS systems, additional spectrum available for hopping sequences would reduce the overall level of potential interference to other systems. For relatively broadband direct-sequence LMS systems, having a second or third channel on which to operate would improve the ability to select a channel with the minimum potential interference. For LMS systems employing relatively narrow bandwidth channels, having additional frequencies from which to select channels would maximize the possibility of avoiding interference. Under any reasonable scenario, then, having additional frequencies available to an LMS operator would greatly reduce potential interference to and from other users of the band.

C. The Field Test Demonstration Requirement Is Unreasonable and Unworkable and Must Be Repealed.

One of the anomalies in the 902-928 MHz band is the fact that, pursuant to Section 90.353(d), LMS operators are required to prove through field tests that their equipment does not cause "unacceptable levels" of interference to Part 15 devices. This requirement was imposed despite the status of licensed LMS operators as primary to the Part 15 devices, which are unlicensed and, under normal circumstances, would have no right to interference protection in the band at all.

Moreover, a review of Part 15 equipment authorizations for the 902-928 MHz band reveals some 2,617 such authorizations, covering a broad range of products and technologies. There is, of course, no way to know for certain how many (or exactly which) of these unlicensed devices are being operated in the band, and in what numbers.

Nor can any licensed LMS system guarantee, without fail, that it will never interfere with a Part 15 device. Indeed, by the very nature of the Part 15 rules, unlicensed devices are simply not entitled to that level of interference protection—nor would it be feasible, given that the concentrations and locations of Part 15 devices are unknown and, in a practical sense, unknowable.

Given that, it is simply not possible or reasonable to require LMS licensees to demonstrate that their systems do not cause unacceptable levels of interference to each and every one of the thousands of Part 15 devices that may be in use in the band (or may not be). The "unacceptable levels of interference" language of Section 90.353(d) is far from an objective engineering standard and is therefore wide open to subjective interpretation, as is the procedure for making any such determination. In short, Section 90.353(d) is a recipe for uncertainty for LMS licensees. In effect, it imposes the onus of ensuring protection from interference on the primary, licensed operators, contrary to the entire intent and practice of Part 15 in all other circumstances and bands. In addition, the existence of the requirement has had an enormously chilling effect on the LMS service and on equipment investment. It represents an open-ended risk that potential investors find intolerable.

Instead of the unworkable language provided in Section 90.353(d) of the Rules, LMS licensees could instead be directed—perhaps through a negotiated rulemaking or industry committee approach—to utilize interference mitigation techniques to provide practical interference protection to Part 15 devices. Again, it is important to remember that LMS licenses cover only 54 percent of the 902-928 MHz band, giving frequency-agile Part 15 devices that are in proximity to LMS transmitters nearly half of the band in which to operate without LMS interference. Furthermore, it must be recognized that LMS services involve, by nature, bursty transmissions. Consequently, even in spectrum “occupied” by LMS services, there will be significant portions of “quiet” time, when no transmissions are taking place. This is particularly true as LMS networks are first deployed and may be very lightly loaded. This attribute of LMS systems will have a dramatic effect on reducing potential interference to other users of the band.

Interference mitigation techniques LMS systems can employ include using directional antennas for base station transmissions, power control algorithms and discontinuous transmissions. Utilizing directional antennas can provide up to 20 dB or more of interference protection to Part 15 devices that are not in the main beam of the antenna. Utilizing dynamic power control algorithms to maintain LMS transmissions at the minimum required power levels can reduce potential interference to Part 15 devices up to 15 dB or more. Discontinuous transmissions can gate off transmitters during even very brief moments when there is no information to send. Even brief lapses in transmissions provide a great interference benefit to other users of the band. Other, more advanced technologies are also available to LMS operators to minimize potential interference in the 902-928 MHz band. Spatial processing techniques, such as that employed in Arraycomm’s iBurst technology, can provide an additional 15 dB of interference protection to other users of the band.

Progeny strongly urges the Commission to consider these techniques and technologies in lieu of the current Section 90.353(d) requirement, which puts an undue burden on LMS providers, breeds uncertainty for potential LMS operators and equipment makers, and remains largely unworkable.

Meanwhile, along with the requirement imposed on LMS providers to prove that their equipment does not interfere with unlicensed Part 15 devices, the Commission's current rules establish a "safe harbor" for Part 15 devices. So long as the devices comply with certain emissions and other technical criteria, such compliance provides a virtual guarantee that these secondary users will not be held to be causing unacceptable levels of interference to LMS systems. This safe harbor provision, taken together with the non-interference mandate imposed on LMS providers in Section 90.353(d), amounts to a complete reversal of non-interference protection rights that more primary-status licensees enjoy in all other bands. In effect, in terms of non-interference rights and protections, Part 15 devices—which are completely unlicensed—have been elevated by the LMS rules to a status higher than the more "primary" LMS licensees. Cumulatively, this has a devastating effect on the perception of LMS as a viable service, because it puts a blanket responsibility upon LMS systems to avoid interference.

Progeny is not asking the Commission to remove all assurances Part 15 users have that they can operate in the band without fear that they will interfere with LMS providers. As noted above, Part 15 devices have 12 MHz of spectrum in the 902-928 MHz band in which they can operate without any fear of interfering with licensed multilateration LMS operations. Moreover, as Part 15 commenters themselves note, they increasingly employ frequency-agile systems that allow their operation even within spectrum blocks that may be used by LMS systems. In addition, in any specific case in which interference poses a potential or real problem, Progeny is open to discussing targeted mitigation techniques through a negotiated rulemaking process or neutral, independent industry coordinating body. Thus, coexistence can be achieved without one-size-fits-all rules that hamper LMS development.

D. The Ban on Interconnection with the PSTN Is Not An Appropriate Way To Safeguard against Interference.

Comments by Part 15 operators and manufacturers indicate that they view the current restriction on interconnection with the PSTN as a way to minimize potential interference by, essentially, limiting the utility of LMS networks to provide widespread messaging services. In other words, they see the ban on interconnection as protection from interference by dampening the traffic on LMS networks. For example, Itron, Inc., quotes from the Commission's 1995 *First Report and Order*, noting the Commission's concern at that time that allowing an expansion of uses of LMS networks would result in more "intensive use" of the band.[9] Itron concludes that "Part 15 and amateur stations need protection against interference from LMS operations as much today as they did when the Commission adopted the LMS service rules, and Progeny's desire for additional flexibility is an insufficient basis for overriding the Commission's interference objectives."[10]

The prohibition on interconnection with the PSTN, however, can do little at this point, or in the future, to achieve those interference objectives. As noted by Havens/Telesaurus, the Commission's current rules do not prohibit real-time messaging delivered as IP-based data (or even voice) transmissions through IP networks, a scenario

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[9] See Itron comments at page 6, quoting *Amendment of Part 90 of the Commission's rules to Adopt Regulations for Automatic Vehicle Monitoring Systems*, 10 FCC Rcd at 4708 (1995).

the Commission could not well have considered in 1995 but which is far more relevant today.[11] Such interconnection to IP networks, particularly for data messaging, could well generate a significant amount of traffic on any LMS network developed using current technology. Therefore, it is not clear what the PSTN interconnection ban continues to achieve.

Progeny believes the ban, taken with other restrictions and regulatory burdens imposed on LMS providers, further isolates and limits the service in the eyes of potential investors and equipment manufacturers. Any restriction on interconnected, real-time data messaging, in particular, is meaningless in the current and future IP environment.

II. Market, Technological, and Regulatory Conditions Have Changed Since the Current LMS Rules Were Set.

A. The Commission's Regulatory Policies Have Evolved for Spectrum Licensing and Unlicensed Part 15 Use Alike.

As Progeny noted in its petition, the Commission's approach to spectrum licensing has not been static. Increasingly, the Commission has evolved policies that allow the marketplace to determine the optimal uses for frequencies, rather than setting stringent service restrictions on licensees. This policy has been made manifest in regulatory decisions that have involved both the licensing of new services and the granting of flexibility for existing licensees to offer additional services. Moreover, the Commission’s Spectrum Policy Task Force, under the leadership of Senior Spectrum

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[10] Itron comments at page 6.
[11] Havens/Telesaurus comments at page 7.

Policy Advisor Paul Kolodzy, is working hard to assess ways in which the Commission can reform its spectrum management processes to promote greater market innovation and "quicker, more adaptive spectrum management techniques." The Task Force is aiming to release a report on its work by the autumn of 2002.[12]

The goal of the Commission's evolving flexibility policy has been to provide a catalyst for licensees to find innovative uses for spectrum that has lain fallow or to offer new services to replace others that have under-performed their market potential. With spectrum flexibility, licensees are more able to respond to market forces and consumer demand. In this way, the market determines optimal spectrum use--not the regulators.

This provides a perfect antidote to one of the major afflictions that regulators are prone to suffer: the inability to predict the future. The Commission could not have acted in 1995--nor can it do so now--to prescribe exact specifications for spectrum use to optimize market demand. No such information can be available to regulators to enable them to foresee future market trends perfectly. The Commission has correctly realized, therefore, that the best strategy is to allow operators to respond to those market trends as they arise, without hamstringing them to comply with preordained service restrictions. The 902-928 MHz band represents a perfect arena in which to apply the Commission's spectrum flexibility policies; persistence with the current, outmoded approach is likely to lead to little or no deployment at all.

The Commission's flexibility policies are on the cutting edge of a worldwide movement away from the traditional allocation approach—complete with detailed service

[12] See "Study Chairman: Dynamic Management Key to Wireless Spectrum Policy, *Communications Daily*, May 30, 2002.

rules—toward more market-oriented methods of making spectrum available, with fewer strings attached. One example of where regulators have applied such flexibility in spectrum licensing is Australia, where the Australian Communications Authority (ACA) has defined the concept of "spectrum space" as a three-dimensional cube.[13] The axes of this cube include geographic coverage area and the amount or "bandwidth" of spectrum being employed. The ACA issues spectrum licenses on this basis, as three-dimensional "cubes" of spectrum space, which are fully tradable in the secondary market. Moreover, the ACA does not dictate either the devices or the services that can be employed or deployed within these tradable spectrum-space cubes. Finally, the ACA levies spectrum usage fees according to the size or volume of each cube, allowing regulators to judge the value of a block of spectrum based upon how large an area it covers, how much power is used (which is related to the coverage area), and how large a chunk of spectrum is being employed. Looking into the future, the world's regulators are likely to continue adopting policies that provide the maximum amount of flexibility and that redefine the definition of spectrum rights based on the interacting variables of area, power, amount of spectrum and even time of transmission.

Commenters argue that the case for spectrum flexibility must be set against the requirement to safeguard the other users in the band from interference. But they have provided no viable rationale as to why the Commission cannot replace its current, blunt-instrument service restrictions with a targeted and flexible interference-mitigation regime.

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[13] See Australian Communications Authority website, fact sheets on Radiocommunications Licensing, accessed June 3, 2002 at http://www.aca.gov.au/licence/index.htm

The Commission has implemented such regimes before, even as it applied its flexibility approach in other bands.

Moreover, at the same time that Part 15 commenters are urging the Commission to deny flexibility to LMS providers, they stand to benefit from the Commission's parallel efforts to give them more flexibility within the Part 15 rules. In docket ET 99-231, the Commission has adopted an order broadening the ability of manufacturers and operators to market unlicensed devices employing a greater range of digital transmission technologies in the 902-928 MHz band, as well as the 2.4 GHz and 5.7 GHz bands.[14] It is these very same technologies that will enhance the Part 15 users' ability to share the 902-928 MHz spectrum band with licensees, including LMS operators. It would be the height of hypocrisy for the Part 15 community to embrace the Commission's grant of flexibility—the very flexibility that decreases the need for strict LMS service restrictions at all—and then turn around and attempt to deny LMS licensees any similar flexibility to maximize their fully licensed technology. To borrow an old maxim, the Part 15 companies want to have their cake—and the LMS providers' too.

B. Within the Market for Unlicensed Networking Devices, Market and Technological Changes Are Leading Away from the 902-928 MHz band.

To judge from some of the comments filed in this proceeding, the 902-928 MHz band is not only primarily reserved for unlicensed devices, it also would appear to be the only band in which these devices can operate. Nothing could be further from the

[14] See *Amendment of Part 15 of the Commission's Rules Regarding Spread-Spectrum Devices*, Second Report and Order, ET Docket No. 99-231, rel. May 30, 2002 *(Part 15 Second Report and Order*).

truth. Unlike LMS companies, which must operate only within the spectrum allocated in their licenses, Part 15 devices can be operated not only throughout the 902-928 MHz band, but in other bands, as well. In fact, contrary to what the License Exempt Alliance and WaveRider imply, the vast majority of wireless local area network, home networking and personal area networking products are designed to operate in the 2.4 GHz or 5.7 GHz bands, not in this one.

The fastest-growing wireless standard in the United States is 802.11, or "Wi-Fi," as it is commonly known. According to the Dell'Oro Group, 802.11(b) products in 2001 alone were a $1.2 billion industry.[15] In addition to the 802.11(b) and 802.11(g) standards, the Home RF and Bluetooth wireless standards also operate in the 2.4 GHz band. The 802.11(a) standard offers higher data rates, with operation in the 5 GHz band. With millions of these products sold, it is very clear that the industry and consumers have embraced these standards as the products of choice for wireless LANs and other short-to-medium range wireless networking.

The License-Exempt Alliance states that "WaveRider Communications has developed…equipment for wireless broadband access in the 902-928 MHz band that is gaining increased acceptance in the marketplace."[16] Apparently, this boils down to 60 systems sold by WaveRider, serving a few thousand customers. Progeny understands that the 902-928 MHz band is a shared band, and it fully intends to be a good spectrum neighbor, but the implication that the 902-928 MHz band is the home to a vast and

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[15] See "Worldwide 802.11 Market Grew 21% in 4Q01 According to Dell'Oro Group," Dell'Oro Group press release, accessed at http://www.delloro.com/PRESS/pressreleases/W:L021402.shtml, May 30, 2002.

[16] License-Exempt Alliance at footnote 8.

growing networking marketplace is simply a distraction. With respect to networking systems in the 902-928 MHz band, there are vastly more popular--and very low-cost--industry standard solutions readily available in the 2.4 GHz band and higher bands. Progeny does not advocate foreclosing development of similar technologies in the 902-928 MHz band, but at the same time, it must oppose using vague and indeterminate assertions of future Part 15 use in the band to foreclose rule changes needed for LMS development, which is already licensed in the band.

III. Progeny Is Proposing A Comprehensive Approach To Balance Regulatory Flexibility for LMS with Interference Mitigation.

A. Progeny's Proposals Would Not Affect Any Operations in the 46 Percent of the Band Not Licensed for Multilateration LMS.

As a threshold matter, there is no likelihood of any potential co-channel interference within the 46 percent of the 902-928 MHz band in which multilateration LMS is not licensed. There is no evidence in the record to indicate that non-multilateration LMS operations in the band have been unable to coexist with Part 15 operations. Since Progeny is not proposing to expand the amount of spectrum in which multilateration LMS is licensed, Progeny's proposals (and in fact this entire proceeding) would have no effect whatsoever on the ability of Part 15 devices to operate free from interference fears in the 902-904 MHz and 909.75-919.75 MHz bands—a total of 12 MHz of spectrum. Part 15 devices—particularly those with frequency-agile capabilities—should be capable of operating in these bands, where they would encounter no requirement to share frequencies with multilateration LMS at all.

It is a measure of the intransigence of many of the parties that filed comments in this band that they have overlooked the fact that multilateration LMS providers are seeking flexibility only with regard to a little more than half of the total spectrum available in the 902-928 MHz band. This is supported by the fact that within the 902-904 MHz and 909-75-919.75 MHz bands, Progeny's proposals would have no effect at all. Progeny considers this evidence that these Part 15 device manufacturers and operators simply wish to avoid allowing any multilateration LMS operator to gain even a toehold in the market. Rather, they appear to wish to retain the status quo, which effectively grants them a spectrum preserve that the Commission never intended, and which their unlicensed and secondary status in the band does not warrant.

B. Progeny Is Proposing Rule Amendments and A Negotiated Rulemaking or Coordination Approach To Establish Targeted Mitigation Where Needed.

Progeny believes that when the availability of 46 percent of the band is coupled with the latest frequency-agile technologies for Part 15 devices and the bursty nature of LMS, there is every likelihood that LMS can operate free of the current service and spectrum restrictions without causing or receiving any harmful interference to or from Part 15 devices. Out of an abundance of caution and prudence, however, Progeny is proposing that the Commission consider a negotiated rulemaking and/or the creation of a permanent process in which LMS or Part 15 operators or manufacturers can identify specific instances in which harmful interference is a potential threat or may be actually occurring. This would allow the parties to pinpoint specific interference problems in specific areas, and to negotiate mitigation measures that would be narrowly targeted to eliminate or suppress harmful interference.[17] Meanwhile, where there is no interference problem, LMS operators and Part 15 companies would be free to market whatever services or devices the market demands.

As stated earlier, within the 14 MHz where multilateration LMS is licensed, a variety of mitigation techniques may be employed, including the use of directional antennas for base stations, power-control algorithms, and discontinuous transmission techniques. In addition, LMS licensees could agree to limits on the amount of spectrum they employ, or to alterations in duty cycles for transmission. In rare circumstances, reasonable power limitations could be negotiated.

Progeny believes this approach would be consistent both with LMS providers' needs for greater service flexibility and the need of all parties to avoid harmful interference. Progeny believes that this interference-mitigation regime likely will be needed only for an interim period—perhaps five to seven years. That will provide enough time for an entire product cycle to occur, permitting Part 15 devices to evolve sufficient spectrum agility to operate without danger of interference from fully loaded LMS networks or, indeed, using spectrum that is not licensed to multilateration LMS at all. Meanwhile, this transition period of five to seven years will allow a reasonable time for LMS networks to become fully loaded with traffic; in the initial stages, networks are likely to bear less traffic as market take-up builds. By the end of the transition period (if not already at this moment) spectrally efficient, frequency-hopping Part 15 devices likely

[17] As an example of such industry-sponsored cooperation on potential interference issues, Progeny notes reports that U.S. wireless carriers are meeting with Direct Audio Radio Service (DARS) licensees XM Satellite Radio Holdings and Sirius Satellite Radio to resolve concerns the wireless carriers have about signal interference from the satellite radio service companies' ground-based repeaters.

will be able to operate without fear of interference to or from LMS networks, which will be used to provide the location, monitoring and messaging services demanded by a competitive marketplace.

IV. The Equitable Balance Sought by the Commission between Part 15 Users and LMS Operators Can Only Be Achieved through A New Rulemaking.

If the Commission does not act, it will have the effect of perpetuating the current, imbalanced situation, in which there is no market or viable service utilizing the licensed LMS spectrum and in which Part 15 operators have in essence gained a "virtual license" to operate within a preserve set aside for their unlicensed spectrum "rights." Meanwhile, given free range within this preserve, Part 15 manufacturers and users will have no incentive to adopt newer, more spectrally efficient frequency-agile devices. The ultimate result will be a failure to optimize the use of this band, one of the most valuable and attractive blocks of spectrum below 3 GHz. Progeny suggests that this sub-optimization of valuable spectrum is not in the public interest, particularly when it involves the sacrifice of LMS, a service with so much potential to directly affect the safety and lives of so many Americans and to indirectly bolster the telecommunications sector and the economy in general.

Progeny is not seeking to push Part 15 users out of the 902-928 MHz band, nor is it seeking a handout or subsidy from the Commission for its own operations. Indeed, Progeny believes the Commission was correct in its motives and efforts to create and license multilateration LMS in this band. Progeny has backed up that belief with its investment in licenses and its attempts to secure a manufacturer for LMS network and subscriber equipment.

As the Commission itself has noted, its regulations were designed to set a finely crafted balance among the interests of all users of the band, licensed and unlicensed. If it was worth it to attempt to set this balance in the first place—and Progeny believes it was—it must be worth it now to follow through with rule modifications to re-calibrate that balance, which has clearly tilted in a way that now prevents multilateration licensees from building networks and deploying services. Moreover, changes have occurred in the market, in regulatory philosophy, and in technological capabilities that not only justify revisiting the current Part 90 rules, they practically demand it. It is not enough for Part 15 users and manufacturers to reject any adjustment in the rules simply because the status quo benefits them in a manner, and to an extent, never contemplated by the Commission when it originally set them. Progeny is not seeking any radical change in Commission policy, nor is it seeking any kind of reallocation of the band. It is asking only that the Commission follow through with its aim of creating adequate space for licensed uses of the band, balancing them with unlicensed uses. That balance, unfortunately, has never actually been achieved.

V. Conclusion

For the reasons stated herein, therefore, Progeny hereby requests that the Commission open a rulemaking proceeding to reexamine its Part 90 rules governing multilateration LMS and to eliminate all unnecessary service restrictions and other rules which have hindered development and deployment of the LMS service.

Sincerely,

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June 3, 2002

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing Reply Comments of Progeny LMS, LLC was sent this 3rd day of June 2002, via first class mail, postage prepaid, to the following:

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